

HISTORIC PROPERTY INVENTORY FORM

IDENTIFICATION SECTION

Field Site No. 241-AW **OAHP No.** _____ **Date Recorded** 01 March 1999
Site Name Historic Common Waste Storage Tank Farm (Double Shell)
Field Recorder JK Keating, DW Harvey
Owner's Name U.S. Department of Energy, Richland Operations Office
Address P.O. Box 550
City/State/Zip Code Richland, WA 99352

Status

- ☒ Survey/Inventory
☐ National Register
☐ State Register
☐ Determined Eligible
☐ Determined Not Eligible
☐ Other (HABS, HAER, NHL)
☐ Local Designation

Photography

Hanford Photo Lab: 81689-5, 7813231-26
Photography Neg. No. HRCL Roll 430, frames 5-8
(Roll No. & Frame No.)
View of Tank construction, Current view
Date 1978, 1978, 1999

Photo at right: Roll 430, frame 7.
View of current tank farm view facing northwest.

Classification ☐ District ☐ Site ☐ Building ☒ Structure ☐ Object
District Status ☒ NR ☐ SR ☐ LR ☐ INV
Contributing ☒
District/Thematic Nomination Name Hanford Site Manhattan Project and Cold War Historic District

Description Section

Materials & Features/Structural Types

Building Type Industry
Plan Cylindrical
Structural System Steel surrounded by reinforced concrete
No. of Stories Not Applicable

Roof Type

☐ Gable ☐ Hip
☐ Flat ☐ Pyramidal
☐ Monitor ☒ Other (specify)
☐ Gambrel Dome
☐ Shed

Cladding (exterior Wall Surfaces)

- ☐ Log
☐ Horizontal Wood Siding
 ☐ Rustic/Drop ☐
 ☐ Clapboard ☐
☐ Wood Shingle
☐ Board and Batten
☐ Vertical Board
☐ Asbestos/Asphalt
☐ Brick
☐ Stone
☐ Stucco
☐ Terra Cotta
☒ Concrete/Concrete Block
☐ Vinyl/Aluminum Siding
☐ Metal (specify) _____
☐ Other (specify) _____

Roof Material

☐ Wood Shingle
☐ Wood Shake
☐ Composition
☐ Slate
☐ Tar/Built-up
☐ Tile
☒ Metal (specify) Steel
☒ Other (specify) Reinforced concrete
☐ Not visible

Foundation

☐ Log ☐ Concrete
☐ Post & Pier ☐ Block
☐ Stone ☐ Poured
☐ Brick ☒ Other (specify)
☐ Not visible steel surrounded by concrete

Integrity

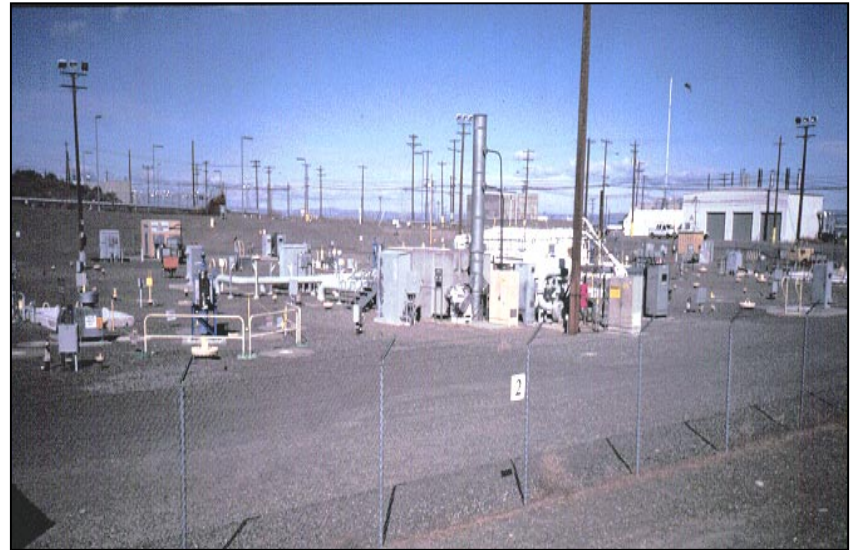
(Include detailed description in
Description of Physical Appearance)

	Intact	Slight	Moderate	Extensive
Changes to plan	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Changes to windows	<input type="checkbox"/> NA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Changes to original cladding	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Changes to interior	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (specify)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

State of Washington, Department of Community Development
Office of Archaeology and Historic Preservation
111 21st Avenue Southwest, Post Office Box 48343
Olympia, Washington 98504-8343 (206)753-4011

LOCATION SECTION

Address 241-AW, 200 West Area
City/Town/County/Zip Code Richland/Benton County/99352
Twp 12N Range 26E Section 2 I/4 Section SE 1/4 1/4 Sec SE
Tax No./Parcel No. _____ **Acreage** _____
Quadrangle or map name _____
UTM References Zone 11 Easting 307200 Northing 5158200
Plat/Block/Lot _____
Supplemental Map(s) _____



High Styles/Forms (Check one or more of the following)

- | | |
|---|---|
| <input type="checkbox"/> Greek Revival | <input type="checkbox"/> Spanish Colonial Revival/Mediterranean |
| <input type="checkbox"/> Gothic Revival | <input type="checkbox"/> Tudor Revival |
| <input type="checkbox"/> Italianate | <input type="checkbox"/> Craftsman/Arts & Crafts |
| <input type="checkbox"/> Second Empire | <input type="checkbox"/> Bungalow |
| <input type="checkbox"/> Romanesque Revival | <input type="checkbox"/> Prairie Style |
| <input type="checkbox"/> Stick Style | <input type="checkbox"/> Art Deco/Art Moderne |
| <input type="checkbox"/> Queen Anne | <input type="checkbox"/> Rustic Style |
| <input type="checkbox"/> Shingle Style | <input type="checkbox"/> International Style |
| <input type="checkbox"/> Colonial Revival | <input type="checkbox"/> Northwest Style |
| <input type="checkbox"/> Beaux Arts/Neoclassical | <input type="checkbox"/> Commercial Vernacular |
| <input type="checkbox"/> Chicago/Commercial Style | <input type="checkbox"/> Residential Vernacular (see below) |
| <input type="checkbox"/> American Foursquare | <input checked="" type="checkbox"/> Other (specify) |
| <input type="checkbox"/> Mission Revival | <u>Industrial Vernacular</u> |

Vernacular House Types

- | | |
|---|---|
| <input type="checkbox"/> Gable Front | <input type="checkbox"/> Cross Gable |
| <input type="checkbox"/> Gable Front and Wing | <input type="checkbox"/> Pyramidal/Hipped |
| <input type="checkbox"/> Side Gable | <input type="checkbox"/> Other (specify) |

NARRATIVE SECTION

Study Unit Themes (check one or more of the following)

☐ Agriculture
☐ Architecture/Landscape Architecture
☐ Arts
☐ Commerce
☐ Communications
☐ Community Planning/Development

☐ Conservation
☐ Education
☐ Entertainment/Recreation
☐ Ethnic Heritage (specify) _____
☐ Health/Medicine
☐ Manufacturing/Industry
☐ Military

☐ Politics/Government/Law
☐ Religion
☐ Science & Engineering
☐ Social Movements/Organizations
☐ Transportation
☒ Other (specify) Cold War Era
☒ **Study Unit Sub-Theme(s)** Waste Management (Liquid)

Statement of Significance

Date of Construction 1978-1980 Architect/Engineer/Builder U.S. Energy Research and Development Administration/Vitro Engineering Corporation

☒ In the opinion of the surveyor, this property appears to meet the criteria of the National Register of Historic Places.

☒ In the opinion of the surveyor, this property is located in a potential historic district (National and/or local).

Tank Farm 241-AW is one of the six double shell tank farms constructed on the Hanford Site between the late 1960's-1980's. 241-AW was built between 1976-1980 with six double shell tanks which all went into operation in 1980. The reason for the construction of the double shell tanks at Hanford was mainly to provide additional storage tanks and increased protection against liquid waste leakage to the environment through the use of the new double shell construction design. Liquid wastes are currently being transferred from leaking single shell tanks to the double shell tanks. Wastes in the double shell tanks are in the form of liquid, slurry (solids suspended in liquid) and sludge (a thick layer with water-insoluble chemicals settled to the bottom of the tank). These wastes consist of high level radioactive liquids created from the process of extracting plutonium from irradiated fuel elements (from the reactors) in the separations and concentration facilities in the 200 Areas. The chemical processes which created this waste were the Bismuth Phosphate (1944), REDOX (1952-1967), PUREX (1956-1988), and the Plutonium Finishing Plant processes. These wastes contain sodium nitrates, sodium nitrites, metal phosphates, carbonates, hydroxides and sulfates. The 241-AW Tank Farm was built primarily to store waste created in the PUREX facility and the 242-A Evaporator. The tank farm however, has also been used to store waste from other facilities.

The 241-AW tanks are continuously monitored for a variety of potential problems and are equipped with instruments to prevent problems and maintain certain controls of the tanks environments. Negative pressure is maintained in the primary tanks by a ventilation system to prevent the release of airborne radioactivity from the tank. The annulus space between the two shells is ventilated to prevent condensation moisture on tank surfaces from being falsely detected as liquid leaks. The level of the liquid waste in the tanks is monitored by either the Computer Automated Surveillance System (CASS) or manually with liquid level tapes. Specific manual instrumentation reads the tank temperature. A network of radiation monitors are set up to detect any ground surface or underground leakage. Leak detection pits allow for sampling for radiation leaks under the tanks. Camera observation posts are located on the tanks and provide visual inspections of the tank interior. The tank farms appear as a fence-enclosed, flat terrain with a multitude of concrete platforms, small shacks, equipment boxes and risers or pipes sticking up from the ground surface. These risers are used for various monitoring and control features. (Also see HPIF for 241-T, TX and TY Tank Farms)

Unlike single shell tanks, no double shell tanks have been known to leak to this date. However, the double shell tanks have a life expectancy of 25-50 years, and thus in the long run could be as vulnerable as the single shell tanks were and the possibility for leaks could exist. However, current clean-up efforts focus on the more immediate concerns of removing all waste from the single shell tanks. Double shell tanks will continue to serve a crucial purpose in waste management of the Hanford Site.

As single shell tanks began to leak liquid waste to the environment, the double shell tank design was created to take over the storage of high level radioactive waste. Transferring the waste out of the single shell tanks to the double shell tanks, which would provide better protection, represents the Hanford Site's awareness of environmental protection through waste management of the tank farms. It is therefore the conclusion of the U.S. Department of Energy that Tank Farm 241-AW is eligible for inclusion in the National Register of Historic Places under Criterion A as a contributing property within the Hanford Site Manhattan Project and Cold War Era Historic District.

(For more information on Hanford Site wastes see Section 6 Waste Management)

(See Continuation Sheets)

Historic Property Inventory Form Continuation Sheet: 241-AW

Description of Physical Appearance

The 241-AW Tank Farm is located along the eastern side of the 200 East Area on 4th Street; just to the northeast of the 202-A PUREX facility. As stated, the tank farm appears as a chain link and barbed wire fenced-in area with a graveled flat terrain. This area contains concrete platforms, small shacks, equipment boxes, vertical pipes, and wooden light poles supporting several large lights each. This tank farm also contains a Central Exhaust Station and an Instrument Building, as well as, value pits and leak detection pits. The 241-AW Tank Farm contains 6 underground, cylindrical shaped, double shell tanks each measuring 75 feet in diameter and 48 feet high with a 1,160,000 gallon capacity. The tanks are covered by approximately 7 feet of soil. These tanks contain a primary and secondary tank (or liner) entirely made of steel which is surrounded by approximately 1.5 feet of reinforced concrete. Between the two tanks is a 2.5 foot space called the "annulus"; a space which allows for sampling to determine leaks. In the case of a leak, the waste can be removed from the annulus before it can leak through the secondary tank to the soil. These tanks have dome shaped roofs of steel covered by 1.25 feet of concrete.

Major Bibliographic References

Brevick, C.H., J.W. Funk & J.L. Stroup. 1997. *Historical Tank Content Estimate for the Southeast Quadrant of the Hanford 200 West Area*. HNF-SD-WM-ER-350, Rev. 1, Fluor Daniel Northwest, Inc. Richland, Washington.

Gephart, R.E and R.R. Lundgren. 1997 Third Printing. *Hanford Tank Clean up: A Guide to Understanding the Technical Issues*. PNL-10773, Pacific Northwest National Laboratory. Richland, Washington.

Rockwell International. 1985. *200 Areas Fact Book*. Richland, Washington.

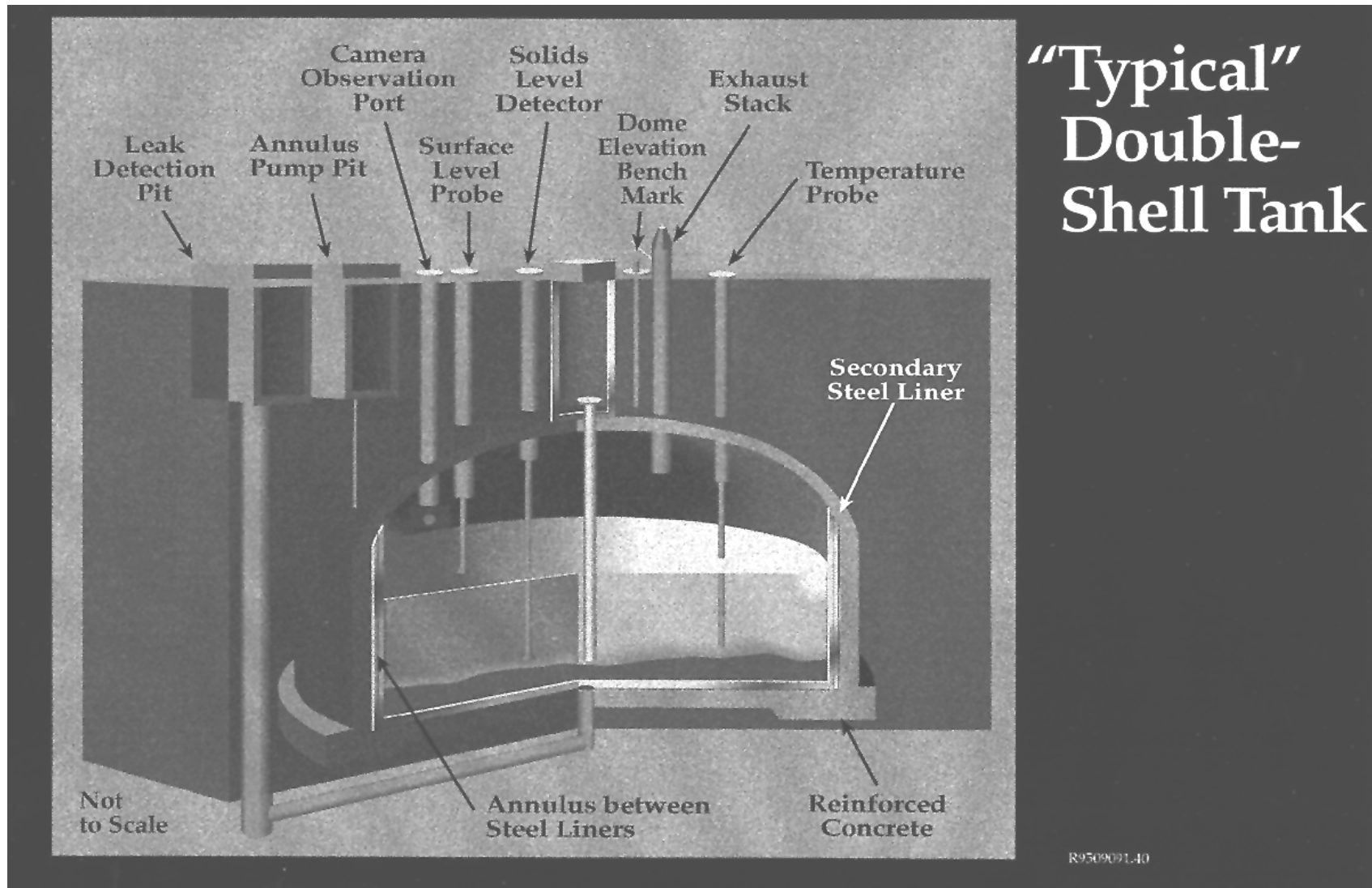


(Negative 81689-5)

Tank Farm 241-AW under construction in 1978



(Negative 7813231-26cn)



Double Shell Tank Design (Graphic #R9509091.40)